

What is claimed is:

1. A method for operating a cardiac pacemaker, comprising:
sensing atrial depolarizations through an atrial sensing channel;
5 sensing ventricular depolarizations through one or more ventricular sensing channels;
pacing a ventricle in accordance with a particular primary pacing mode; and,
switching the pacemaker to an atrial fibrillation pacing mode upon detection of
an atrial tachyarrhythmia, wherein the atrial fibrillation mode includes ventricular
10 resynchronization pacing and adjustment of a ventricular escape interval in order to
regularize the rate at which ventricular beats occur.
2. The method of claim 1 wherein the adjustment of the ventricular escape
interval is based on a previous value of the ventricular escape interval and a measured
15 intrinsic ventricular rate.
3. The method of claim 1 wherein the adjustment of the ventricular escape
interval increases the ventricular escape interval after a ventricular pace is delivered
and decreases the ventricular escape interval after a ventricular sense.
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4. The method of claim 1 wherein the adjustment of the ventricular escape
interval increases the ventricular escape interval after each ventricular pace is
delivered and decreases the ventricular escape interval after each ventricular sense.
- 25 5. The method of claim 1 wherein the adjustment of the ventricular escape
interval is performed by increasing the ventricular escape interval after each
ventricular pace is delivered and decreasing the ventricular escape interval after each
ventricular sense by computing a weighted average of a previous value of the
ventricular escape interval and an RR interval, where the RR interval is the interval
30 between the ventricular sense and the preceding ventricular sense or pace.

6. The method of claim 1 wherein the ventricular resynchronization pacing is biventricular pacing with a selected biventricular offset interval.

5 7. The method of claim 6 wherein the adjustment of the ventricular escape interval is based on a previous value of the ventricular escape interval and a measured intrinsic ventricular rate which increases the ventricular escape interval after a ventricular pace is delivered and decreases the ventricular escape interval after a ventricular sense.

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8. The method of claim 7 wherein the pacemaker is normally operated in a primary pacing mode that includes atrial-triggered ventricular pacing, and wherein switching to an atrial fibrillation mode includes reverting to a non-atrial triggered ventricular pacing mode.

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9. The method of claim 7 wherein the primary pacing mode includes ventricular resynchronization pacing which is different from the ventricular resynchronization pacing in the atrial fibrillation mode.

20 10. The method of claim 7 wherein the primary pacing mode is a single ventricle pacing mode which does not include ventricular resynchronization pacing.

11. A cardiac pacemaker, comprising:
an atrial sensing channel for sensing atrial depolarizations;
25 a ventricular sensing channel for sensing ventricular depolarizations;
right and left pacing channels for delivering paces to the right and left ventricles;
a controller for controlling the delivery of paces in accordance with a primary pacing mode; and,

wherein the controller is configured to switch the pacemaker to an atrial fibrillation pacing mode upon detection of an atrial tachyarrhythmia, wherein the atrial fibrillation pacing mode includes ventricular resynchronization pacing and adjustment of a ventricular escape interval in order to regularize the rate at which ventricular beats
5 occur.

12. The pacemaker of claim 11 wherein the adjustment of the ventricular escape interval is based on a previous value of the ventricular escape interval and a measured intrinsic ventricular rate.

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13. The pacemaker of claim 11 wherein the adjustment of the ventricular escape interval increases the ventricular escape interval after a ventricular pace is delivered and decreases the ventricular escape interval after a ventricular sense.

14. The pacemaker of claim 11 wherein the adjustment of the ventricular escape interval increases the ventricular escape interval after each ventricular pace is delivered and decreases the ventricular escape interval after each ventricular sense.

15. The pacemaker of claim 11 wherein the adjustment of the ventricular escape interval is performed by increasing the ventricular escape interval after each ventricular pace is delivered and decreasing the ventricular escape interval after each ventricular sense by computing a weighted average of a previous value of the ventricular escape interval and an RR interval, where the RR interval is the interval between the ventricular sense and the preceding ventricular sense or pace.

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16. The pacemaker of claim 11 wherein the ventricular resynchronization pacing is biventricular pacing with a selected biventricular offset interval.

17. The pacemaker of claim 16 wherein the adjustment of the ventricular escape interval is based on a previous value of the ventricular escape interval and a measured intrinsic ventricular rate which increases the ventricular escape interval after a ventricular pace is delivered and decreases the ventricular escape interval after a
5 ventricular sense.

18. The pacemaker of claim 17 wherein the pacemaker is normally operated in a primary pacing mode that includes atrial-triggered ventricular pacing, and wherein switching to an atrial fibrillation mode includes reverting to a non-atrial triggered
10 ventricular pacing mode.

19. The pacemaker of claim 17 wherein the primary pacing mode includes ventricular resynchronization pacing which is different from the ventricular resynchronization pacing in the atrial fibrillation mode.
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20. The pacemaker of claim 17 wherein the primary pacing mode is a single ventricle pacing mode which does not include ventricular resynchronization pacing.

21. A method for operating a cardiac pacemaker, comprising:
20 sensing atrial depolarizations through an atrial sensing channel;
sensing ventricular depolarizations through one or more ventricular sensing channels;
pacing a ventricle in accordance with a particular primary pacing mode; and,
switching the pacemaker to an atrial fibrillation pacing mode upon detection of
25 an atrial tachyarrhythmia, wherein the atrial fibrillation mode includes ventricular resynchronization pacing.

22. The method of claim 21 wherein the ventricular resynchronization pacing is biventricular pacing.

23. A cardiac pacemaker, comprising:
- an atrial sensing channel for sensing atrial depolarizations;
 - a ventricular sensing channel for sensing ventricular depolarizations;
 - right and left pacing channels for delivering paces to the right and left
- 5 ventricles;
- a controller for controlling the delivery of paces in accordance with a primary pacing mode; and,
- wherein the controller is configured to switch the pacemaker to an atrial fibrillation pacing mode upon detection of an atrial tachyarrhythmia, wherein the atrial
- 10 fibrillation pacing mode includes ventricular resynchronization pacing.
24. The pacemaker of claim 23 wherein the ventricular resynchronization pacing is biventricular pacing.